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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/642,266	08/18/2003	Ayako Nakano	03180.0332	2400

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EXAMINER

SIEK, VUTHE

ART UNIT PAPER NUMBER

2825

DATE MAILED: 04/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

<b>Office Action Summary</b>	<b>Application No.</b> 10/642,266	<b>Applicant(s)</b> NAKANO ET AL.	
	<b>Examiner</b> Vuthe Siek	<b>Art Unit</b> 2825	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 18 August 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 5,6,11,12,17 and 18 is/are allowed.
- 6) ☒ Claim(s) 1-4,7-10 and 13-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>8/18/03</u> . | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. This office action is in response to application 10/642,266 filed on 8/18/2003.

Claims 1-18 remain pending in the application.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 7 and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Falbo et al. (US 2003/0163791).
3. As to claims 1, 7 and 13, Falbo et al. teach a shape-based geometry engine to perform smoothing and other layout beautification operations (correcting pattern design layout). The shape-based geometry correction engine prepares a mask pattern used in a lithography process for transferring a circuit pattern intersecting with a step pattern on a substrate which has the step pattern designed thereon (Example shown in Fig. 3a and 3b, 5a-c, 11a-c). Then the shape-based geometry correction engine applies actions or correction patterns to the mask pattern accordance with correction rules considering a shape of the step pattern (0044-0047, 0050-0055, 0097, 0098). As shown in Fig. 3a, there is an overlapping region between the patterns 310 and 320 that forms a

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connection there between. This clearly shown intersection of edges of the circuit pattern and the step pattern (pattern 310 and pattern 320) as shown in Fig. 3b (combined pattern 350). Then, the shape-based correction engine applies a desired corrective action to the combined pattern 350 that include both the circuit pattern and the step pattern (pattern 310 and 320, as shown as item 350 of Fig. 3B). Accordingly, the desired corrective action is applied at the intersections of edges of the circuit pattern and the step pattern and in the vicinity of the intersections, thereby the desired corrective action associated with the shape pattern 350 that include both the circuit pattern and the step pattern (pattern 310 and pattern 320) and the intersections of edges and the vicinity of the intersections can accurately widen and align the correction formed by the edges 323-325 of interconnect polygon 320 with gate 310.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2-3, 8-10 and 14-15 are rejected under 35 U.S.C. 103(a) as being obvious over Falbo et al. (US 2003/0163791) in view of Ahrens et al. (6,664,010).

6. As to claims 2, 8 and 14, although it is well known in the art that using lithography simulations to perform proximity correction based on correction rules, Falbo et al. does not explicitly teach that. Ahrens et al. teach the claimed limitation (col. 3, lines 1-16, col.

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6, lines 1-20). Using lithography simulations based on correction rules and applying in Falbo et al. corrective action, it would have been obvious to one of ordinary skill in the art the claimed limitation because this would accurately correct the design pattern including the intersections of edges of the combined patterns to comply with design rules as required.

7. As to claims 3, 9 and 15, Falbo et al. teach the shape of the step pattern includes pattern width/height/length as two-dimensional shapes of the patterns (Fig. 2-6, 11-12).

8. Claims 4, 10 and 16 are rejected under 35 U.S.C. 103(a) as being obvious over Falbo et al. (US 2003/0163791) in view of Ahrens et al. (6,664,010) and further view of Yoshida (6,268,234).

9. As to claims 4, 9 and 16, Falbo et al. and Ahrens et al. do not teach the circuit pattern defines impurity implantation regions. Yoshida teach forming the readout gate sections by implementing an impurity into the readout gate section forming regions and photosensor forming regions of a substrate at the same time in a device forming step in which an impurity is implanted into the substrate in order to resolve the problem of misregistration of photomask during manufacturing (col. 3 lines 1-40; col. 5 lines 1-50). By combining these teachings, it would have been obvious to one of ordinary skill in the art at the time the invention was made the claimed invention because implanting an impurity would also increase transfer efficiency thereby the circuit pattern can be formed accurately.

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***Allowable Subject Matter***

10. Claims 5-6, 11-12 and 17-18 are allowed over the prior art of record.

The prior art of record does not teach or fairly suggest measuring step and reviewing step as recited in the claims.


***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vuthe Siek whose telephone number is (571) 272-1906. The examiner can normally be reached on Increase Flextime.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Vuthe Siek

  
VUTHE SIEK  
PRIMARY EXAMINER